

and vaccinia are two perfectly distinct diseases, calls for some comment in the light of recent investigations, and the omission of any reference to the statistics of the Sheffield epidemic of 1887-8 is a serious blot on any work dealing with the history of small-pox. The immunity from small-pox which infants and children enjoy at the present day, receives the not very satisfying explanation that they now have measles, whooping-cough, scarlatina, and diphtheria instead!

In the later chapters the author deals with the last-mentioned diseases and with infantile diarrhoea, dysentery and cholera, the history of which is traced with great care and accuracy. It would indeed be difficult to praise too highly the pains which the author has taken in the collection and arrangement of his historical facts. But he has chosen to add, in many places, considerations as to the nature and causes of the diseases he chronicles, which frequently do not cover all that is known about the subject, and would have been better omitted or treated separately from the historical portions of the book. It is true that, in some cases, there are strong reasons for believing that the virus of a disease may reside in the soil, but it is by no means true for others. It is true that we are ignorant of the precise nature of the virus of many of the diseases discussed in the book; but it is not the case with all. Yet in no single passage dealing with ætiology do we find any reference to even well-established bacteriological facts. It may be that much studying of the records of the past begets a tendency to a mediæval frame of mind. Certainly Dr. Creighton's views on telluric influences will not commend themselves to the modern pathologist, though, like the subjects he treats of, they may possess a historical interest.

But it is a great merit of the book that it can be read with pleasure and instruction by all, however the reader may differ from the author in pathological creed; and Dr. Creighton may be congratulated upon the completion of so excellent and thorough a history of epidemic diseases in this country.

#### OUR BOOK SHELF.

*Grundzüge der mathematischen Chemie.* Von Dr. G. Helm. (Leipzig: Wilhelm Engelmann, 1894).

THE treatment of the subject-matter of this book is based on the view that in its present state of development, that branch of physical chemistry which relates to chemical change can be discussed from a general standpoint, inasmuch as it affords the clearest and most complete confirmation of the principle of the conservation of energy.

The applications of this principle to chemical interactions are first illustrated by means of the different kinds of thermal measurements, numerical examples being given, the solutions of which, here as elsewhere in the book, are particularly neat. Mechanical forms of energy attending chemical change, in particular the volume energy of gases, are also discussed. The author next points out that the measures of the different forms of energy are composed of two factors, one of which is all-important in determining the direction of the energy change. Temperature and entropy are shown to be the factors of heat energy, and a clear and concise account of the thermodynamics of perfect gases is given, in order

to arrive at the shape of the entropy function, which is of course known in this particular case. The relations between heat energy and volume energy, and between heat energy and electrical energy, are then set out at length.

The author here indicates how terms involving what he calls the "chemical intensity" of the reacting substances enter into the energy equations. Chemical intensity is what Gibbs originally termed the "potential" of the substances, and this function, it is hoped, will eventually be shown to be the mathematical expression of chemical affinity.

The third section of the book is devoted to the properties of chemical intensity. The general method of deriving the law of mass action is given, and chemical equilibrium, the properties of dilute solutions, and the velocity of chemical reactions are brought under the sway of the energy equations. The last section contains the treatment of the phenomena which may be grouped around Gibbs's phase rule, and of reactions depending on several parameters.

The book is the only one which is exclusively devoted to chemical energetics, and to the student possessed of sufficient mathematical knowledge it offers an admirable account of the present state of the subject. J. W. R.

*Die Bearbeitung des Glases auf dem Blasetische.* Von D. Djakonow und W. Lermantoff. Pp. 154. (Berlin: R. Friedländer and Sohn, 1895.)

THE original edition of this book was in Russian, and the authors, one of whom, D. Djakonow, is now dead, were demonstrators in chemistry at St. Petersburg University. The instruments and methods employed by glass-blowers are set forth in detail, together with descriptions of the kinds of glass best suited for different work. A very full and practical account is given of the construction, graduation, and calibration of thermometers; but to carry out these operations thoroughly, some experience is required. Work more suitable for the 'prentice hand fills the greater part of the book. Every operation in glass-blowing and manipulation likely to be needed in physical and chemical laboratories, appears to be described; while the diagrams illustrating the stages in the construction of the different pieces of apparatus, will greatly assist in training students to become skilled workers.

*Problems and Solutions in Elementary Electricity and Magnetism.* By W. Slingo and A. Brooker. Pp. 108. (London: Longmans, Green, and Co.)

MODEL answers to examination questions may prove a blessing or a curse, according to the way in which teachers use them. Herein are answers to questions in electricity and magnetism (elementary stage), set at the Science and Art Department's examination from 1885 to 1894, together with a series of original questions. The teacher who wishes to train his class to answer questions clearly and concisely, will find suitable exercises in composition in this book, and he will also find the volume an inducement to cram his students with undigested information.

*Qualitative Chemical Analysis of Inorganic Substances.* (New York: American Book Company, 1895.)

THIS work consists of a series of analytical tables, supplemented by explanatory and descriptive notes, and working directions. It makes no pretence to originality, and is hardly a book we should like to see widely adopted by students of elementary practical chemistry. The tables, which were prepared for use in Georgetown College, Washington, D.C., present few points of interest or value to teachers of chemistry in our schools.